

[nex20] Variances and covariances.

A stochastic variable X can have values $x_1 = 1$ and $x_2 = 2$ and a second stochastic variable Y the values $y_1 = 2$ and $y_2 = 3$. Determine the variances $\langle\langle X^2 \rangle\rangle$, $\langle\langle Y^2 \rangle\rangle$ and the covariance $\langle\langle XY \rangle\rangle$ for two sets of joint probability distributions as defined in [nl7]:

- (i) $P(x_1, y_1) = P(x_1, y_2) = P(x_2, y_1) = P(x_2, y_2) = \frac{1}{4}$.
- (ii) $P(x_1, y_1) = P(x_2, y_2) = 0$, $P(x_1, y_2) = P(x_2, y_1) = \frac{1}{2}$.

Solution: